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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,057	12/11/2003	Todd F. Bischoff	71745 CCD	2508

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Christopher C. Dunham  
c/o Cooper & Dunham LLP  
1185 Ave of the Americas  
New York, NY 10036

EXAMINER
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DANIELS, MATTHEW J

ART UNIT	PAPER NUMBER
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1732

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/735,057

Applicant(s)

BISCHOFF ET AL.

Examiner

Matthew J. Daniels

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/9/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. The response received 9 September 2005 did not appear to affirm the provisional election of Group I. However, the cancellation of the withdrawn claims is interpreted as affirmation of the election. The Examiner notes that all business with the Patent and Trademark Office should be transacted in writing, and that the action of the Patent and Trademark Office will be based exclusively on the written record in the Office. See 37 CFR 1.2. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### *Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 2, and 4-6** are rejected under 35 U.S.C. 103(a) as being obvious over Yamamoto (USPN 4690867) in view of Shea (USPN 2698256) and Callis (USPN 2502418). Yamamoto teaches a method of making an unfired refractory component (7:53-64) comprising:

- a) forming a slurry comprising calcium silicate-containing refractory material (5:21-27)
- b) placing the slurry in a mold (6:4-22)
- d) hydrothermally processing the component to form a final product (6:23-36)

Yamamoto teaches calcium oxide in the form of lime, but appears to be silent to a slurry also comprising a barium- or strontium-containing compound and drying the slurry. However, Shea teaches a barium or strontium containing compound (3:10-16) and Callis teaches drying (4:24-34). It would have been prima facie obvious to one of ordinary skill in the art at the time of invention to incorporate the methods of Shea and Callis into that of Yamamoto in view of Shea's teachings that calcium oxides and hydroxides are interchangeable with barium or strontium oxides and hydroxides (Shea, 3:3-26 and Callis, 1:37-44) and to produce insulating blocks having good resistance to rupture and a low thermal conductivity (Callis, 1:15-25). **As to Claim 2**, Shea teaches barium oxide and hydroxides (3:10-15). Callis also teaches barium oxide and hydroxides (1:37-38 and 2:29-35). **As to Claims 4-6**, Callis teaches forming an aqueous solution of barium hydroxide (1:37-44 and 2:29-55) wherein the aqueous solution is prepared with water at a temperature of at least 30 C (2:29-35) and at least 40 C (2:29-35).

3. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (USPN 4690867) in view of Shea (USPN 2698256) and Callis (USPN 2502418), and further in view of Lucas (GB 580,916). Yamamoto, Callis, and Shea teach the subject matter of Claims 1 and 2. See the rejection of Claims 1-2 under 35 USC 103(a). **As to Claim 3**, Shea teaches barium sulphate (6:45-49) as a slurry applied as an impregnant into the surface of an article. Additionally, Lucas teaches barium sulphate, in either a dry or liquid state, mixed with silicates applied to protect refractory materials (Page 1, Lines 53-92). The coating provides the beneficial aspect of preventing contamination of molten aluminum (Page 1, Lines 10-22). It would have been prima facie obvious to incorporate the method of Lucas into the method of Yamamoto,

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Callis, and Shea because doing so would protect the entire refractory material, avoid contamination of the aluminum melt, and prevent excessive shrinking during drying and heating (Page 1, lines 74-87).

### ***Response to Arguments***

4. Applicant's arguments filed 9 September 2005 have been fully considered but they are not persuasive. The arguments appear to be on the following grounds:

a) It is to be noted that the method requires the use of both calcium silicate-containing refractory and a barium- or strontium- containing compound.

b) Yamamoto does not mention problems caused by reaction with the refractory.

c) Shea discloses that "Following acidification, it is the preferably practice to wash the resulting siliceous product until it is substantially free from acid *and soluble salts*". Consequently, if a compound of barium or strontium is used in the method of Shea, it does not end up in the final refractory and is used only transitory to increase the surface area and reactivity of the silica particles.

d) Shea mentions the use of alkaline earth compounds with the reactive siliceous materials, but only for the formation of cements with better weathering characteristics and strength. Clearly their intended use is for outdoor applications, rather than the formation of refractories in industrial settings. There is therefore no reason why a person skilled in the art would be encouraged to use such compounds in Yamamoto's method.

e) Shea discloses barium sulfate as a pigment to color the face or surfaces of the final product, but a skilled person would not see a need to color a face of a refractory intended for contact with

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molten metal, and the pigment is applied to the final product, rather than in the process of preparing.

f) The product of Callis is different from that of the present invention. Additionally, there is no suggestion of a subsequent hydrothermal treatment.

5. These arguments are not persuasive for the following reasons:

a, b, c) In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In this regard, the Applicant's arguments appear to rely on Shea's disclosure of the salts being removed during the processing to distinguish Shea's method from that of Yamamoto. However, it should be considered which aspects of Shea's method were relied upon. Yamamoto teaches most of the process steps recited in Claim 1, and forms the primary basis for the rejection. What Yamamoto appears to lack is the barium or strontium compound.

The Examiner's submits that Yamamoto teaches a process which uses at least an oxide of calcium (5:20-23) in combination with silicates (5:21-29) and is cured (5:18). Shea provides teaching that oxides of calcium, barium, and strontium are used interchangeably (3:10-15), and therefore constitute art-recognized functional equivalents which provide the same effect. It is the Examiner's position that one of ordinary skill would have found it prima facie obvious to substitute Yamamoto's calcium oxide with barium oxide or strontium oxide in view of their art-recognized equivalency.

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It should also be noted that Callis also provides teaching of the art-recognized equivalency of these materials at 1:37-40:

The alkaline earth oxide which may be used in my process may be that of calcium, barium, magnesium, strontium, as well as a mixture of any of these, such as a calcium-magnesium oxide mixture made from dolomite. The calcium oxide or	40
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The Examiner submits that the ordinary artisan would have been familiar with the references to both Shea and Callis, and would have recognized the equivalency of oxides of calcium, barium, and strontium as binders. The barium or strontium compounds *match the function, way, and result* of Yamamoto's method using calcium oxide, and *the substitution proposed by Applicant's claim does not play a role substantially different from Yamamoto's calcium oxide.*

One would have been motivated to make the combination and substitution to provide any number of beneficial effects, including good resistance to rupture under bending and compressive stresses, and having low thermal conductivity (See Callis, 1:16-25), provided by oxides of calcium, barium, and strontium used as binders (2:18-28 and 1:16-25).

d) The Examiner submits that Shea's teaching of better weathering characteristics and strength support motivation for a combination with Yamamoto. Why would these aspects be undesirable? While the Applicant's arguments point to a distinction in the intended use of Yamamoto's and Shea's products, the Examiner submits that Shea's product is capable of performing the intended use claimed in this application, *particularly when it is impregnated with barium sulfate* (Shea, 6:45-49). Compare this with Lucas' teachings in Page 1, lines 74-87, and the Examiner submits that Shea's product would have obviously been suitable for contact with liquid metals.

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It is unclear whether the argument asserts that Shea's method is non-analogous to that of Yamamoto, or whether it is intended to challenge the motivation to combine the references. However, the Examiner submits that the method of Shea is analogous art as being drawn to "high temperature heat insulation" (1:22), which appears to be within the same field of endeavor as Applicant and Yamamoto. One would have been motivated to make the combination to provide, as taught by Callis, good resistance to rupture under bending and compressive stresses and low thermal conductivity (Callis, 1:16-25), and because of the art-recognized equivalency of the claimed barium and strontium compounds with oxides of calcium.

e) Shea's teachings are acknowledged, however, it should be noted the rejection was not over Shea alone. Shea was cited for teaching of barium sulfate, but Lucas was relied upon for teaching of barium sulphate, in either a dry or liquid state, mixed with silicates applied to protect refractory materials (Page 1, Lines 53-92). As such, this is not merely a coating, but a second *layer* comprising both of the materials that are claimed in this application. In view of the beneficial aspects which Lucas teaches, namely the prevention of the penetration of aluminum into the firebrick (Page 2, lines 1-4), the prevention of contamination of molten aluminum (Page 1, Lines 10-22), and that this particular combination helps prevent excessive shrinkage (Page 1, lines 78-81), the Examiner submits that the combination of Lucas' barium sulfate with Yamamoto, Shea, and Callis, would have been *prima facie* obvious.

Additionally, the Applicant's remarks directed to Singer on the bottom of Page 6 are noted. In the reference provided by Applicant, GB 580,916 (cited on the 24 May 2004 IDS), both Singer and Lucas are listed in the first paragraph of the reference. It was unclear to the Examiner by which name the reference should be described and to whom the patent was granted,



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and thus both names were used. The Applicant is thanked for bringing the inconsistent use of "Lucas" in the claim rejection, and subsequently "Singer and Lucas" in the body of the rejection, to the Examiner's attention. The rejection is corrected to indicate that the GB 580,916 patent appears to be to Lucas alone, and the reference is referred to by that name. Additionally, the statement of the rejection of Claim 3 was clarified to show that the rejection was made over *Yamamoto*, *Shea*, *Callis*, and further in view of *Lucas*.

f) It should be noted that *Yamamoto* teaches the hydrothermal treatment. See the rejection of Claim 1. In response to applicant's arguments against *Callis*' reference individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


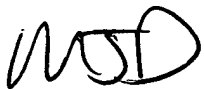
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450.

The examiner can normally be reached on Monday - Friday, 7:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJD 11/18/05



MICHAEL P. COLAIANNI  
SUPERVISORY PATENT EXAMINER